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| 10/689,126  | 10/20/2003  | John B. Condon       | BLD920030025US1     | 2905             |
| 50441 7590 05/01/2008<br>DUFT BORNSSEN & FISHMAN, LLP<br>1526 SPRUCE STREET<br>SUITE 302<br>BOULDER, CO 80302 |             |                      |                     |                  |
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| DICKERSON, CHAD S   |             |                      |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/689,126

**Applicant(s)**

CONDON ET AL.

**Examiner**

Chad Dickerson

**Art Unit**

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 April 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 9-13, 18-21 and 25 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-4, 9-13, 18-21 and 25 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 10/20/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/9/2008 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-4, 9-13, 18-21 and 25 have been considered but are moot in view of the new ground(s) of rejection. The Amendment to the claims has necessitated the new ground(s) of rejection. However, the Examiner believes that the reference of Wood still applies to apart of the claim Amendment.

The reference of Wood discloses the feature of the data work units, or data files, stored in the memory buffers (34 or 36) in order for these files to be accessed by the processors (40) to be processed for printing. The processors are considered analogous to the compute nodes. In reference to the control work unit, the segment data file (22) is used to include all the PDL commands necessary to interpret the segment by the PDL processors, and thus performs the feature of the control work unit (see paragraphs [0029]-[0033]). In the system, since these same jobs, considered as data units, can be stored in the memory buffers to be scheduled to be processed, the feature of performing

the data work unit on a queue to be accessible by computer nodes is carried out by the invention of Wood. Therefore, the features of "*wherein each work unit may be either a data work unit or a control work unit*" and "*queueing each data work unit on a queue accessible by a plurality of compute nodes*" are taught by Wood and are disclosed below.

Also, the other claim features added that are not disclosed as taught above are disclosed in the new ground(s) of rejection below.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 9-13, 18-21 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over McIntyre '478 (US Pat No 6690478) in view of Wood '934 (US Pub No 2004/0243934), Motamed '958 (US Pat No 6559958) and Salgado '621 (US Pat No 6504621).

Re claim 1: McIntyre '478 discloses a method and apparatus for utilizing multiple versions of a page descriptor language comprising the steps of:

processing each of the plurality of work units by at least one compute node to convert each work unit into a second format (i.e. in McIntyre '478, a plurality of print jobs, considered as work units can be processed. The printer driver (114), considered

as the compute node, processes the incoming print jobs by recognizing the type of PDL is input into the system. The printer driver selects a PDL type from a PDL registry (112) to correspond with the incoming data and this PDL type chosen is used to convert the data into a different format, analogous to the second format, which is a low-level data stream; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

However, McIntyre '478 fails to teach a) parsing the datastream into a plurality of work units in a first format, wherein each work unit may either be a data work unit or a control work unit, queueing each data work unit on a queue accessible by a plurality of compute nodes.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses parsing the datastream into a plurality of work units in a first format (i.e. the apparatus and method of Wood '934 divides the PDL data stream to provide a plurality of PDL segments and then to create associated first and second data segments for each of the PDL segments. These segments are in a PDL format, analogous to a first format and the function of parsing is performed by the dividing and interpreting the PDL data stream into a plurality of segments, which the plurality of segments are considered as the plurality of work units; see figs. 1-4; paragraphs [0004]-[0014] and [0025]-[0029]),

wherein each work unit may either be a data work unit or a control work unit (i.e. the feature of the data work units, or data files, stored in the memory buffers (34 or 36) in order for these files to be accessed by the processors (40) to be processed for printing. The processors are considered analogous to the compute nodes. In reference

to the control work unit, the segment data file (22) is used to include all the PDL commands necessary to interpret the segment by the PDL processors, and thus performs the feature of the control work unit; see paragraphs [0029]-[0033]);

queueing each data work unit on a queue accessible by a plurality of compute nodes (i.e. on the buffers, the files (20 and 22) contain information that enable the PDL information to be converted to the file the PDL information represents by the PDL processors; see paragraphs [0029]-[0033]) and

a control work unit processed by a computer node (i.e. in the system, the files (20 and 22) can be considered as either a data unit or a control unit. Since some files contain the instructions for the PDL processors, these files can be considered as control work units. These work units can be processed in the PDL processors considered as the computer nodes; see paragraphs [0029]-[0033]).

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to parse the datastream into a plurality of work units in a first format, wherein each work unit may either be a data work unit or a control work unit, queueing each data work unit on a queue accessible by a plurality of compute nodes and a control work unit processed by a computer node in order to divide the PDL data stream to provide a plurality of PDL segments (as stated in Wood '934 paragraph [0014]).

However, the combination of McIntyre '478 and Wood '934 fails to teach wherein each work unit may be processed independent of all other work units and wherein the plurality of work units are parsed from a single job and wherein the processing of each

work unit is independent of processing of the other work units and wherein multiple work units are processed in parallel by multiple compute nodes.

However, this is well known in the art as evidenced by Motamed '958. Motamed '958 discloses wherein each work unit may be processed independent of all other work units (i.e. in Motamed '958, the pages processed in a print job is considered as a work unit since a page can be processed independent from other pages in the system; see col. 4, lines 48-67) and wherein the plurality of work units are parsed from a single job (i.e. the plurality of pages processed in the system are from a single print job; see col. 4, lines 48-67) and wherein the processing of each work unit is independent of processing of the other work units (i.e. the pages processed in the system are independently processed from other pages in the processors depending on the page attributes and the availability of the processors in the system; see col. 4, lines 48-67) and wherein multiple work units are processed in parallel by multiple compute nodes (i.e. the multiple pages in the system are processed in parallel with the multiple processors used in the system. The processors (35-37) are considered to be analogous to the compute nodes since these processors perform processing on the different parts of the print job; see figs. 3 and 6; col. 4, lines 45-67).

Therefore, in view of Motamed '958, it would have been obvious to one of ordinary skill at the time the invention was made to have the method step of wherein each work unit may be processed independent of all other work units and wherein the plurality of work units are parsed from a single job and wherein the processing of each work unit is independent of processing of the other work units and wherein multiple work

units are processed in parallel by multiple compute nodes incorporated in the device of McIntyre '478, as combined with the features of Wood '934, in order to have multiple processors perform parallel processing (as stated in Motamed '958 col. 4, lines 45-67).

However, the combination of McIntyre '478, Wood '934 and Motamed '958 fails to teach wherein each control unit may be an immediate control work unit or a scheduled work unit or an interrupt control work unit; queuing a scheduled control work unit at a tail of the queue to be processed by a compute node after all other work units presently in the queue; queuing an immediate control work unit at a head of the queue to be processed by a compute node before all other work units in the queue; forwarding an interrupt control work unit to a compute node immediately regardless of any work units in the queue.

However, this is well known in the art as evidenced by Salgado '621. Salgado '621 discloses wherein each control unit may be an immediate control work unit or a scheduled work unit or an interrupt control work unit (i.e. with the different types of jobs being queued in Example 1, each type of job reflects a different type of control work unit. For example, the interrupt control work unit is analogous to the Authorized User Job in EXAMPLE 1 in column 19. Once this AU job reaches the system, it is immediately processed and interrupts the job that is currently being processed. The net print job is considered analogous to the immediate control work unit since this job is immediately placed at the head of the queue before all work units in the queue. This job is also similar to the copy job listed in the same column 18. The system report error job



is considered as the schedule control work unit since it is paced at the end of the queue after all the other jobs presently in the queue; see col. 18, line 40 – col. 20 36);

queueing a scheduled control work unit at a tail of the queue to be processed after all other work units presently in the queue (i.e. when looking at EXAMPLE 1 in column 18, this example shows examples of the different types of control work units. The system error report job is considered as the schedule work unit, placed at the end of the queue and not processed until the jobs before the system error report job are processed beforehand; see col. 18, line 40 – col. 20, line 36);

queueing an immediate control work unit at a head of the queue to be processed before all other work units in the queue (i.e. the net print job is considered analogous to the immediate control work unit since this job is immediately placed at the head of the queue before all work units in the queue. This job is also similar to the copy job listed in the same column 18; see col. 18, line 40 – col. 20, line 36);

forwarding an interrupt control work unit immediately regardless of any work units in the queue (i.e. the interrupt control work unit is analogous to the Authorized User Job in EXAMPLE 1 in column 19. Once this AU job reaches the system, it is immediately processed and interrupts the job that is currently being processed; see col. 18, line 40 – col. 20, line 36).

Therefore, in view of Salgado '621, it would have been obvious to one of ordinary skill at the time the invention was made to have the feature of wherein each control unit may be an immediate control work unit or a scheduled work unit or an interrupt control work unit; queueing a scheduled control work unit at a tail of the queue to be processed

after all other work units presently in the queue; queuing an immediate control work unit at a head of the queue to be processed before all other work units in the queue; forwarding an interrupt control work unit immediately regardless of any work units in the queue incorporated in the device of McIntyre '478, as combined with the features of Wood '934 and Motamed '958, in order to have a system with a queue for structuring an order in which a plurality of print jobs is to be processed (as stated in Salgado col. 5, lines 6-29).

Re claim 2: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the method, wherein the parsing step (a) includes:

providing a plurality of sources, wherein each source is associated with at least one transform (i.e. in McIntyre '478, a method for registration and selection of multiple page description languages (i.e. personalities) is presented. The personalities, analogous to a plurality of sources, are associated with a transform, or conversion, in order to convert the input instructions into a printer dependent data stream interpreted by the printing subsystem (108) to produce an output page; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25);

instantiating at least one source of the plurality of sources, wherein the at least one instantiated source is associated with the datastream format (i.e. the printer driver (114) recognizes a realization of the personality related to the transform, or instantiates one transform, in order to perform a conversion, that is associated with received

instructions. The printer driver (114) analyzes these received instructions and chooses one of the multiple PDLs registered in the PDL registry (112); see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25); and

utilizing the at least one source (i.e. once the printer driver (114) finds an appropriate version of a PDL registered within the PDL registry (112), the printer driver invokes the personality, or utilizes the personality analogous to the source, to convert the instructions from a high level language to a printer dependent data stream; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

However, McIntyre '478 fails to teach to parse the datastream.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses to parse the datastream (i.e. the apparatus and method of Wood '934 divides the PDL data stream to provide a plurality of PDL segments and then to create associated first and second data segments for each of the PDL segments. These segments are in a PDL format, analogous to a first format and the function of parsing is performed by the dividing and interpreting the PDL data stream into a plurality of segments, which the plurality of segments are considered as the plurality of work units; see figs. 1-4; paragraphs [0004]-[0014] and [0025]-[0029]).

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to parse the datastream in order to divide the PDL data stream to provide a plurality of PDL segments (as stated in Wood '934 paragraph [0014]).

Re claim 3: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the method, wherein the processing step (b) includes:

loading the at least one transform associated with the at least one instantiated source in the at least one compute node (i.e. the printer driver (114) recognizes a transform, or conversion, associated with at least one realization of the personality, analogous to an instantiated source, that is able to perform the transform and invokes the personality, or PDL, to perform the conversion of the received instructions. The action of invoking the personality after associated the PDL with the received data is analogous to immediately loading the transform in order to be utilized for transformation of the received data; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25); and

utilizing the at least one transform to convert a work unit of the plurality of work units from the first format to the second format (i.e. in the system of McIntyre '478, the system is able to process a plurality of print jobs, considered as work units. The PDL utilized by the printer driver (114) to convert the received instructions, or print job, from a high level language to a printer dependent data, or language, is analogous to converting a work unit from a first format to a second format; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

Re claim 4: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

However, McIntyre '478 fails to teach the method further comprising: (c) load balancing the plurality of work units.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses the method further comprising: (c) load balancing the plurality of work units (i.e. by sequentially assigning data files in Wood '934 to the next available PDL processor, the workload of processing data files (20) and (22) may be automatically load-balanced between various PDL processors. The data files are analogous to the plurality of work units; see paragraph [0033]).

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to have the step of load balancing the plurality of work units in order to automatically load-balance the workload of processing data files in the system (as stated in Wood '934 paragraph [0033]).

Re claim 9: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the method, wherein the at least one source is instantiated as a dynamic library (i.e. when using a transform to convert incoming data into another form, the printer driver (114) requests for a transform to convert from the incoming PDL into a low-level language for the printer to understand. This is performed by linking the incoming data to the specific personality that will perform the transformation of the data stream to the low-level format. This process is similar to a library with a collection of subprograms used to develop other pieces of information used by the system and

provide the function of transformation that is linked to a certain input language in the invention of McIntyre '478; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

Re claim 10: McIntyre '478 discloses a method and apparatus for utilizing multiple versions of a page descriptor language, the program instructions for:

processing each of the plurality of work units by at least one compute node to convert each data work unit into a second format (i.e. in McIntyre '478, a plurality of print jobs, considered as work units can be processed. The printer driver (114), considered as the compute node, processes the incoming print jobs by recognizing the type of PDL is input into the system. The printer driver selects a PDL type from a PDL registry (112) to correspond with the incoming data and this PDL type chosen is used to convert the data into a different format, analogous to the second format, which is a low-level data stream. Also, with the above actions capable of being performed on a storage medium having stored the executable instructions to implement the teachings of the invention of McIntyre '478, the above feature of a computer readable medium containing program instructions is performed; see figs. 1, 3 and 6; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160, col. 6, lines 1-25 and col. 7, lines 7-23).

However, McIntyre '478 fails to teach parsing the datastream into a plurality of work units in a first format, wherein each work unit may either be a data work unit or a control work unit; queueing each data work unit on a queue accessible by a plurality of compute nodes and a control work unit processed by a computer node.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses parsing the datastream into a plurality of work units in a first format (i.e. the apparatus and method of Wood '934 divides the PDL data stream to provide a plurality of PDL segments and then to create associated first and second data segments for each of the PDL segments. These segments are in a PDL format, analogous to a first format and the function of parsing is performed by the dividing and interpreting the PDL data stream into a plurality of segments, which the plurality of segments are considered as the plurality of work units; see figs. 1-4; paragraphs [0004]-[0014] and [0025]-[0029]),

wherein each work unit may either be a data work unit or a control work unit (i.e. the feature of the data work units, or data files, stored in the memory buffers (34 or 36) in order for these files to be accessed by the processors (40) to be processed for printing. The processors are considered analogous to the compute nodes. In reference to the control work unit, the segment data file (22) is used to include all the PDL commands necessary to interpret the segment by the PDL processors, and thus performs the feature of the control work unit; see paragraphs [0029]-[0033]);

queueing each data work unit on a queue accessible by a plurality of compute nodes (i.e. on the buffers, the files (20 and 22) contain information that enable the PDL information to be converted to the file the PDL information represents by the PDL processors; see paragraphs [0029]-[0033]) and

a control work unit processed by a computer node (i.e. in the system, the files (20 and 22) can be considered as either a data unit or a control unit. Since some files contain the instructions for the PDL processors, these files can be considered as control

work units. These work units can be processed in the PDL processors considered as the computer nodes; see paragraphs [0029]-[0033]).

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to parse the datastream into a plurality of work units in a first format, wherein each work unit may either be a data work unit or a control work unit, queueing each data work unit on a queue accessible by a plurality of compute nodes and a control work unit processed by a computer node in order to divide the PDL data stream to provide a plurality of PDL segments (as stated in Wood '934 paragraph [0014]).

However, McIntyre '478 in view of Wood '934 fails to teach wherein each work unit may be processed independent of all other work units and wherein the plurality of work units are parsed from a single job and wherein the processing of each work unit is independent of processing of the other work units and wherein multiple work units are processed in parallel by multiple compute nodes.

However, this is well known in the art as evidenced by Motamed '958. Motamed '958 discloses wherein each work unit may be processed independent of all other work units (i.e. in Motamed '958, the pages processed in a print job is considered as a work unit since a page can be processed independent from other pages in the system; see col. 4, lines 48-67) and wherein the plurality of work units are parsed from a single job (i.e. the plurality of pages processed in the system are from a single print job; see col. 4, lines 48-67) and wherein the processing of each work unit is independent of processing of the other work units (i.e. the pages processed in the system are independently



processed from other pages in the processors depending on the page attributes and the availability of the processors in the system; see col. 4, lines 48-67) and wherein multiple work units are processed in parallel by multiple compute nodes (i.e. the multiple pages in the system are processed in parallel with the multiple processors used in the system. The processors (35-37) are considered to be analogous to the compute nodes since these processors perform processing on the different parts of the print job; see figs. 3 and 6; col. 4, lines 45-67).

Therefore, in view of Motamed '958, it would have been obvious to one of ordinary skill at the time the invention was made to have the method step of wherein each work unit may be processed independent of all other work units and wherein the plurality of work units are parsed from a single job and wherein the processing of each work unit is independent of processing of the other work units and wherein multiple work units are processed in parallel by multiple compute nodes in order to have multiple processors perform parallel processing (as stated in Motamed '958 col. 4, lines 45-67).

However, the combination of McIntyre '478, Wood '934 and Motamed '958 fails to teach wherein each control unit may be an immediate control work unit or a scheduled work unit or an interrupt control work unit; queuing a scheduled control work unit at a tail of the queue to be processed after all other work units presently in the queue; queuing an immediate control work unit at a head of the queue to be processed before all other work units in the queue; forwarding an interrupt control work unit immediately regardless of any work units in the queue.

However, this is well known in the art as evidenced by Salgado '621. Salgado '621 discloses wherein each control unit may be an immediate control work unit or a scheduled work unit or an interrupt control work unit (i.e. with the different types of jobs being queued in Example 1, each type of job reflects a different type of control work unit. For example, the interrupt control work unit is analogous to the Authorized User Job in EXAMPLE 1 in column 19. Once this AU job reaches the system, it is immediately processed and interrupts the job that is currently being processed. The net print job is considered analogous to the immediate control work unit since this job is immediately placed at the head of the queue before all work units in the queue. This job is also similar to the copy job listed in the same column 18. The system report error job is considered as the schedule control work unit since it is placed at the end of the queue after all the other jobs presently in the queue; see col. 18, line 40 – col. 20 36);

queueing a scheduled control work unit at a tail of the queue to be processed after all other work units presently in the queue (i.e. when looking at EXAMPLE 1 in column 18, this example shows examples of the different types of control work units. The system error report job is considered as the schedule work unit, placed at the end of the queue and not processed until the jobs before the system error report job are processed beforehand; see col. 18, line 40 – col. 20, line 36);

queueing an immediate control work unit at a head of the queue to be processed before all other work units in the queue (i.e. the net print job is considered analogous to the immediate control work unit since this job is immediately placed at the head of the

queue before all work units in the queue. This job is also similar to the copy job listed in the same column 18; see col. 18, line 40 – col. 20, line 36);

forwarding an interrupt control work unit immediately regardless of any work units in the queue (i.e. the interrupt control work unit is analogous to the Authorized User Job in EXAMPLE 1 in column 19. Once this AU job reaches the system, it is immediately processed and interrupts the job that is currently being processed; see col. 18, line 40 – col. 20, line 36).

Therefore, in view of Salgado '621, it would have been obvious to one of ordinary skill at the time the invention was made to have the feature of wherein each control unit may be an immediate control work unit or a scheduled work unit or an interrupt control work unit; queuing a scheduled control work unit at a tail of the queue to be processed after all other work units presently in the queue; queuing an immediate control work unit at a head of the queue to be processed before all other work units in the queue; forwarding an interrupt control work unit immediately regardless of any work units in the queue incorporated in the device of McIntyre '478, as combined with the features of Wood '934 and Motamed '958, in order to have a system with a queue for structuring an order in which a plurality of print jobs is to be processed (as stated in Salgado col. 5, lines 6-29).

Re claim 11: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the computer readable medium of claim 10, wherein the parsing instruction (a) includes:

providing a plurality of sources, wherein each source is associated with at least one transform (i.e. in McIntyre '478, a method for registration and selection of multiple page description languages (i.e. personalities) is presented. The personalities, analogous to a plurality of sources, are associated with a transform, or conversion, in order to convert the input instructions into a printer dependent data stream interpreted by the printing subsystem (108) to produce an output page; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25);

instantiating at least one source of the plurality of sources, wherein the at least one instantiated source is associated with the datastream format (i.e. the printer driver (114) recognizes a realization of the personality related to the transform, or instantiates one transform, in order to perform a conversion, that is associated with received instructions. The printer driver (114) analyzes these received instructions and chooses one of the multiple PDLs registered in the PDL registry (112); see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25); and

utilizing the at least one source (i.e. once the printer driver (114) finds an appropriate version of a PDL registered within the PDL registry (112), the printer driver invokes the personality, or utilizes the personality analogous to the source, to convert the instructions from a high level language to a printer dependent data stream; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

However, McIntyre '478 fails to teach to parse the datastream.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses to parse the datastream (i.e. the apparatus and method of Wood '934 divides the PDL data stream to provide a plurality of PDL segments and then to create associated first and second data segments for each of the PDL segments. These segments are in a PDL format, analogous to a first format and the function of parsing is performed by the dividing and interpreting the PDL data stream into a plurality of segments, which the plurality of segments are considered as the plurality of work units; see figs. 1-4; paragraphs [0004]-[0014] and [0025]-[0029]).

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to parse the datastream in order to divide the PDL data stream to provide a plurality of PDL segments (as stated in Wood '934 paragraph [0014]).

Re claim 12: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the computer readable medium of claim 11, wherein the processing instruction includes:

loading the at least one transform associated with the at least one instantiated source in the at least one compute node (i.e. the printer driver (114) recognizes a transform, or conversion, associated with at least one realization of the personality, analogous to an instantiated source, that is able to perform the transform and invokes the personality, or PDL, to perform the conversion of the received instructions. The

action of invoking the personality after associated the PDL with the received data is analogous to immediately loading the transform in order to be utilized for transformation of the received data; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25); and

utilizing the at least one transform to convert a work unit of the plurality of work units from the first format to the second format (i.e. in the system of McIntyre '478, the system is able to process a plurality of print jobs, considered as work units. The PDL utilized by the printer driver (114) to convert the received instructions, or print job, from a high level language to a printer dependent data, or language, is analogous to converting a work unit from a first format to a second format; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

Re claim 13: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

However, McIntyre '478 fails to teach the computer readable medium further comprising: load balancing the plurality of work units.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses the computer readable medium further comprising: (c) load balancing the plurality of work units (i.e. by sequentially assigning data files in Wood '934 to the next available PDL processor, the workload of processing data files (20) and (22) may be automatically load-balanced between various PDL processors. The data files are analogous to the plurality of work units; see paragraph [0033]).

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to have the step of load balancing the plurality of work units in order to automatically load-balance the workload of processing data files in the system (as stated in Wood '934 paragraph [0033]).

Re claim 18: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the computer readable medium, wherein the at least one source is instantiated as a dynamic library (i.e. when using a transform to convert incoming data into another form, the printer driver (114) requests for a transform to convert from the incoming PDL into a low-level language for the printer to understand. This is performed by linking the incoming data to the specific personality that will perform the transformation of the data stream to the low-level format. This process is similar to a library with a collection of subprograms used to develop other pieces of information used by the system and provide the function of transformation that is linked to a certain input language in the invention of McIntyre '478; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

Re claim 19: McIntyre '478 discloses a method and apparatus for utilizing multiple versions of a page descriptor language comprising:

a central component for receiving the datastream in a first format (i.e. McIntyre '478 discloses a control driver that receives the datastream in a high-level language, or

a first format; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25);

a plurality of sources in the central component, wherein each of the plurality of sources is associated with at least one transform (i.e. the plurality of personalities, considered as sources, are managed by both the control driver (104) and the boot agent (102). Since the control driver manages the personalities, this can be considered as having the personalities in the control driver (104) to be managed; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25); and

at least one compute node coupled to the central component (i.e. the printer driver (114), considered as the compute node, is coupled to the control driver (104); see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25),

wherein the central component instantiates at least one source of the plurality of sources (i.e. the control driver (104) uses the printer driver (114) to create a particular realization of a printer description language, or instantiates, through recognizing the personality in the system, which is analogous to the plurality of sources; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25), and distributes each of the work units to the at least one compute node,

wherein the at least one compute node converts each data work unit into a second format (i.e. in McIntyre '478, a plurality of print jobs, considered as work units can be processed. The printer driver (114), considered as the compute node, processes the incoming print jobs by recognizing the type of PDL is input into the



system. The printer driver selects a PDL type from a PDL registry (112) to correspond with the incoming data and this PDL type chosen is used to convert the data into a different format, analogous to the second format, which is a low-level data stream; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

However, McIntyre '478 fails to teach parses the datastream into a plurality of work units in the first format, a queue, at least one compute node coupled to the central component via the queue, wherein the central component distributes each of the work units to the at least one compute node by queueing each data work unit on a queue accessible by a plurality of compute nodes and a control work unit to be processed by a computer node, wherein the at least one compute node converts each data work unit into a second format independent of all other compute nodes operable on other work units, and wherein at least two compute nodes are operable in parallel to convert at least two data work units in parallel.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses parses the datastream into a plurality of work units in the first format (i.e. the apparatus and method of Wood '934 divides the PDL data stream to provide a plurality of PDL segments and then to create associated first and second data segments for each of the PDL segments. These segments are in a PDL format, analogous to a first format and the function of parsing is performed by the dividing and interpreting the PDL data stream into a plurality of segments, which the plurality of segments are considered as the plurality of work units; see figs. 1-4; paragraphs [0004]-[0014] and [0025]-[0029]),

a queue (i.e. in the system, the memory buffers (34 and 36) can be considered as the queue or the memory buffer (40) can be considered as the queue; see paragraphs [0025]-[0029]); and

at least one compute node coupled to the central component via the queue (i.e. in the system, a PDL processor is coupled to the schedule segments portion (24), considered as the central component, via the processor FIFO, considered as the queue in this scenario; see paragraphs [0025]-[0029]),

wherein the central component distributes each of the work units to the at least one compute node by queueing each data work unit on a queue accessible by a plurality of compute nodes (i.e. in the system, the schedule segments portion is used as the central component to distribute global and data segment files, considered as work units, to the plurality of PDL processors by queueing the global and data segment files in the memory buffers (40), which are accessible from the PDL processor, considered analogous to the computer nodes; see fig. 3; see paragraphs [0025]-[0029]), and

a control work unit to be processed by a computer node (i.e. in the system, the files (20 and 22) can be considered as either a data unit or a control unit. Since some files contain the instructions for the PDL processors, these files can be considered as control work units. These work units can be processed in the PDL processors considered as the computer nodes; see paragraphs [0029]-[0033])

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to parse the datastream into a plurality of work units in the first format, a queue, at least one compute node coupled to the central

component via the queue, wherein the central component distributes each of the work units to the at least one compute node by queueing each data work unit on a queue accessible by a plurality of compute nodes and a control work unit to be processed by a computer node in order to divide the PDL data stream to provide a plurality of PDL segments (as stated in Wood '934 paragraph [0014]).

However, McIntyre '478 in view of Wood '934 fails to teach wherein each data work unit may be processed independent of all other work units and wherein the plurality of work units are parsed from a single job and wherein the processing of each work unit is independent of processing of the other work units, wherein the at least one computer node converts each data work unit independent of all other compute nodes operable on other work units and wherein at least two compute nodes are operable in parallel to convert at least two data work units in parallel.

However, this is well known in the art as evidenced by Motamed '958. Motamed '958 discloses wherein each data work unit may be processed independent of all other work units (i.e. in Motamed '958, the pages processed in a print job is considered as a work unit since a page can be processed independent from other pages in the system; see col. 4, lines 48-67),

wherein the plurality of work units are parsed from a single job (i.e. the plurality of pages processed in the system are from a single print job; see col. 4, lines 48-67),

wherein the processing of each work unit is independent of processing of the other work units (i.e. the pages processed in the system are independently processed

from other pages in the processors depending on the page attributes and the availability of the processors in the system; see col. 4, lines 48-67) and

wherein the at least one computer node converts each data work unit independent of all other compute nodes operable on other work units (i.e. the processors are able to convert the pages assigned to them independently from other processors and pages in the system. At the end of the processing, the pages are then combined together into the original job that the pages or units of the job originated from; see col. 4, lines 48-67 and col. 5, lines 1-63), and

wherein at least two compute nodes are operable in parallel to convert at least two data work units in parallel (i.e. the multiple pages in the system are processed in parallel with the multiple processors used in the system. The processors (35-37) are considered to be analogous to the compute nodes since these processors perform processing on the different parts of the print job; see figs. 3 and 6; col. 4, lines 45-67).

Therefore, in view of Motamed '958, it would have been obvious to one of ordinary skill at the time the invention was made to have the method step of wherein each work unit may be processed independent of all other work units and wherein the plurality of work units are parsed from a single job and wherein the processing of each work unit is independent of processing of the other work units, wherein the at least one computer node converts each data work unit independent of all other compute nodes operable on other work units and wherein at least two compute nodes are operable in parallel to convert at least two data work units in parallel in order to have multiple processors perform parallel processing (as stated in Motamed '958 col. 4, lines 45-67).

However, the combination of McIntyre '478, Wood '934 and Motamed '958 fails to teach the features of by queuing a scheduled control work unit at a tail of the queue to be processed after all other work units presently in the queue, by queuing an immediate control work unit at a head of the queue to be processed before all other work units in the queue and by forwarding an interrupt control work unit immediately regardless of any work units in the queue.

However, this is well known in the art as evidenced by Salgado '621. Salgado '621 discloses the feature of by queueing a scheduled control work unit at a tail of the queue to be processed after all other work units presently in the queue (i.e. when looking at EXAMPLE 1 in column 18, this example shows examples of the different types of control work units. The system error report job is considered as the schedule work unit, placed at the end of the queue and not processed until the jobs before the system error report job are processed beforehand; see col. 18, line 40 – col. 20, line 36);

by queueing an immediate control work unit at a head of the queue to be processed before all other work units in the queue (i.e. The net print job is considered analogous to the immediate control work unit since this job is immediately placed at the head of the queue before all work units in the queue. This job is also similar to the copy job listed in the same column 18; see col. 18, line 40 – col. 20, line 36);

by forwarding an interrupt control work unit immediately regardless of any work units in the queue (i.e. the interrupt control work unit is analogous to the Authorized User Job in EXAMPLE 1 in column 19. Once this AU job reaches the system, it is

immediately processed and interrupts the job that is currently being processed; see col. 18, line 40 – col. 20, line 36).

Therefore, in view of Salgado '621, it would have been obvious to one of ordinary skill at the time the invention was made to have the features of the features of by queuing a scheduled control work unit at a tail of the queue to be processed after all other work units presently in the queue, by queuing an immediate control work unit at a head of the queue to be processed before all other work units in the queue and by forwarding an interrupt control work unit immediately regardless of any work units in the queue incorporated in the device of McIntyre '478, as combined with the features of Wood '934 and Motamed '958, in order to have a system with a queue for structuring an order in which a plurality of print jobs is to be processed (as stated in Salgado col. 5, lines 6-29).

Re claim 20: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the system of claim 19, wherein each of the at least one compute nodes loads the at least one transform as a dynamic library (i.e. the printer driver (114), considered as the compute node, is able to utilize a personality, analogous to a transform, in interpreting incoming data. The incoming data is analyzed by the control driver (104) and the link between the incoming data and the appropriate personality to use for interpretation is made. The link of the incoming data to a collection of software used to change or provide services to other programs is an

example of a dynamic library; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25) and utilizes the at least one transforms to convert a work unit in the first format to the second format (i.e. the printer driver (114) utilizes one of the personalities, or transforms, to convert a print job, considered as a work unit, from a high-level language to a low-level language that the printer can understand. This is analogous to converting from a first to a second format; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

Re claim 21: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

However, McIntyre '478 fails to teach the system of claim 19, wherein the central component further includes: a load balancing mechanism coupled to the at least one source for distributing the plurality of work units to the at least one compute node.

However, this is well known in the art as evidenced by Wood '934. Wood '934 discloses a load balancing mechanism coupled to the at least one source for distributing the plurality of work units to the at least one compute node (i.e. in Wood '934, the segment data files (22) are in a buffer memory (40) with a scheduler process (24), analogous to a load balancing mechanism, that accesses the data files and distributes the data files, analogous to work units, to the PDL processors, which are analogous to the compute nodes; see figs. 1 and 4; paragraphs [0030]-[0034]).

Therefore, in view of Wood '934, it would have been obvious to one of ordinary skill at the time the invention was made to have a load balancing mechanism coupled to

the source for distributing a plurality of work units to the compute node in an order dependent manner (as stated in Wood '934 paragraphs [0030]-[0034]).

Re claim 25: The teachings of McIntyre '478 in view of Wood '934, Motamed '958 and Salgado '621 are disclosed above.

McIntyre '478 discloses the system, wherein the at least one source is instantiated as a dynamic library (i.e. when using a transform to convert incoming data into another form, the printer driver (114) requests for a transform to convert from the incoming PDL into a low-level language for the printer to understand. This is performed by linking the incoming data to the specific personality that will perform the transformation of the data stream to the low-level format. This process is similar to a library with a collection of subprograms used to develop other pieces of information used by the system and provide the function of transformation that is linked to a certain input language in the invention of McIntyre '478; see figs. 1 and 3; col. 2, lines 18-30, col. 4, lines 11-66, col. 5, lines 160 and col. 6, lines 1-25).

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
6. Vennekens '711 (US Pat No 5652711) discloses a system that parses a data stream into a plurality of PDL data stream segments in a high-level language and each of these segments are stored in a FIFO queue before the segments are output to a sub-



process where the segments are converted to a low-level language. Load balancing is performed in regards to the segments in the system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAD DICKERSON whose telephone number is (571)270-1351. The examiner can normally be reached on Mon. thru Thur. 9:00-6:30 Fri. 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Haskins can be reached on (571)-272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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